# DOMCom PC Installation Instructions

**John Jacobsen**
**jacobsen@rust.lbl.gov**


**Lawrence Berkeley National Laboratory**

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This document describes the configuration of the six DOMCom PCs used in the DAQ for AMANDA's String 18 at the South Pole. Five DOMCom PCs are to be deployed at Pole, and one is to remain at LBNL for testing. These PCs each contain 8 DOMCom boards. The DOMCom boards enable communications with the string of Digital Optical Modules (DOMs) deployed in the ice at the South Pole.

**Look for updated versions of this document at**
`http://rust.lbl.gov/~jacobsen/docs/installation_of_domcom_machines.pdf`and
`http://rust.lbl.gov/~jacobsen/docs/installation_of_domcom_machines.doc`

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**Hardware Preparation**

Rearrange hardware inside:
Make 8 contiguous ISA slots (move parallel connector to PCI area).
Cable IDE hard disk to primary IDE controller; cable CD-ROM drive to secondary. Make sure both are jumpered as master devices.
We replaced the passive backplanes on most and power supplies on all five units destined for Pole.

*Important:* Before installing in the rack, open the cover of the PCs and verify that no cables are blocking any fans from turning.

When cover is closed, power on. Hit "Del" key right away to change the BIOS settings.

**BIOS Settings**

BIOS Update 1: Free IRQ 10 in BIOS by setting its IRQ handling to be "Legacy ISA" rather than ISA/PnP:
Select PNP/PCI CONFIGURATION
Set "Resources Controlled by:" to Manual
Set "IRQ 10 Controlled by" to "Legacy ISA"
We will need IRQ 10 for the DOMCOM Device Driver (tb).

BIOS Update 2: Change BIOS to boot from CD:
Select BIOS FEATURES SETUP
Select Boot Sequence
Select CDROM,C,A

BIOS Update 3: In "Integrated Peripherals," make sure
Serial1 is 3F8/IRQ4
Serial2 is 2F8/IRQ3
Also make sure IR port is disabled (just below serial settings in the same menu)

Exit and save BIOS settings.

See the Appendix on BIOS Settings for screen shots of a working machine.

**Linux Installation**

Boot RedHat 7.1 install disk.
Select default option by typing return
(If blue screen appears with no further change in > 60 seconds, hit the reset button and try again)
Choose defaults until you get to the "Install Options" screen.
Then choose "custom system" installation.
Partition manually with Disk Druid
Delete existing DOS partition

Add the following partitions:

| | | |
|---|---|---|
| /boot | 38 MB | Linux native |
| / | 6000 MB | Linux native |
| swap | 256 MB | Linux swap |
| | 1024 MB | FAT (for DOS) (leave mount point blank) |
| /home | (use remaining) | Linux native |

Click on Next. Select all available partitions to format. Check "check for bad blocks". Click on Next.
LILO configuration: use defaults
Network configuration: use defaults (DHCP)
Firewall: choose no firewall
Timezone info – I chose California, but this should probably be UTC eventually.
Set root password. Create DOM account with user dom.
Authentication – choose defaults
Package installation – choose the following:

- Printers
- X-Windows
- Gnome
- Mail/WWW/News
- DOS/Windows connectivity
- Networked workstation
- Dialup workstation (for minicom)
- Anonymous FTP
- Emacs
- Development
- Kernel development
- Utilities

X-Configuration: choose defaults for the screens, however in the "Custom Configuration," select "text login" rather than "Graphical."
Click next twice and wait for awhile while software packages are installed. You'll have to change CDs once.

**Linux Configuration**

Let the system reboot.
Log in as dom.
Run /sbin/ifconfig. Read the Hwaddr field. It should be something like "00:E0:4C:51:00:A3".
This is the MAC address. Write it on the front panel. Also see below for the MAC addresses.

Change shell to tcsh using the program chsh.
Scp .cshrc from another installed host to dom account.
Scp .bashrc from another installed host to root account.
Log out and log in again (to activate new shell) or type "/bin/tcsh"

Disable unneeded and possibly insecure services:

Sendmail, portmap, nfslock:
su
/sbin/chkconfig --level 012345 sendmail off
/sbin/chkconfig --level 012345 portmap off
/sbin/chkconfig --level 012345 nfslock off

**DOMCom Driver Software Installation**

Set up the FPGA area in the DOM account (used to store working versions)

su dom
mkdir /home/dom/fpga
scp the FPGA designs from another machine to this directory

Set up the software release directories:

su
mkdir /usr/local/dom

chown dom /usr/local/dom.
su dom
cd /usr/local/dom
mkdir bin lib driver fpga
mkdir bin/backup lib/backup

Get the driver, syncserver software, etc.:
Change back to the dom home directory with "cd"
cvs checkout domsoft

Build the driver:
su dom
Change to the driver directory: "cd ~/domsoft/src/driver"
make
su, then make install

Build syncserver, dataserver:
su dom
Change to the portio directory: "cd ~/domsoft/src/portio"
make
make install

Make sure tbrc (the startup script for syncserver, dataserver and the driver) is in /etc/rc.d/init.d:
su
/sbin/chkconfig --list | grep tbrc
Assuming it's there, turn it on for the normal runlevels:
/sbin/chkconfig --level 345 tbrc on

Create the device files /dev/tb*:
su
mknod /dev/tb0 c 88 0
mknod /dev/tb1 c 88 1
mknod /dev/tb2 c 88 2
mknod /dev/tb3 c 88 3
mknod /dev/tb4 c 88 4
mknod /dev/tb5 c 88 5
mknod /dev/tb6 c 88 6
mknod /dev/tb7 c 88 7
chmod 0666 /dev/tb*

Reboot; log in as dom; su; watch the system log with tail –f /var/log/messages; connect using domtalk from outside, see if test board driver (tb), syncserver and dataserver show up in the system log.

**Additional software installation**

Installation of minicom: copy minicom-1.83.1-8.i386.rpm from Jacobsen's account on rust.
rpm -ivh minicom-1.83.1-8.i386.rpm

Run it as root, create initialization file:
minicom -s com1
Enter serial port setup

Change as follows:
Serial device -> /dev/ttyS0
Lockfile -> /var/lockS0
Hardware flow control -> no
chmod o+rw /dev/ttyS0
chmod o+rw /dev/ttyS1

**Current Status**

Hardware swapped in all machines for Pole.

| Machine | new backplane | new psupp | gps works | domcom works |
|---|---|---|---|---|
| Tbdaq-1 | yes | yes | yes | yes |
| Tbdaq-2 | | yes | yes | yes |
| Tbdaq-3 | | yes | yes | yes |
| Tbdaq-4 | | yes | yes | yes |
| Tbdaq-5 | yes | yes | yes | yes |
| Tbdaq-6 | swapped to old type | no | yes | yes |

*Earlier notes:*
Tbdaq-1 is loaded. Driver, dataserver and syncserver are loaded. System is ready to test w/ DOMCom boards. Tbdaq-1 has "DMA Interrupt Errors" associated with the hard disk. They seem to not actually cause any problems. We swapped CPUs, CDs and hard disks with another unit which did not seem to fix the problem. The errors don't seem to affect anything, so we are shipping the unit as is.

Tbdaq-2 seems flaky. System crashed twice during install. After changing the host name in the network setup, gnome crashed and now it doesn't even boot at all.
Try reinstall. Tried many things. Basically nothing worked with this CPU board. Installed ok using board from system 2.
Reinstalled using CPU 6. CPU 6 is now CPU 2. MAC and IP addresses below updated. System 2 looks ok.

Tbdaq-3 – install going ok. Nuke install during testing of other flaky units. Reinstall ok. Driver software up to date as of 10/17/01.

Tbdaq-4 – when selecting partitioning method, setup crashes and tells me it's ok to reboot the system. Recabled system so that CD and disk are both master on their own IDE bus. Disk gets primary, CD gets secondary. Installation proceeds ok at that point. Software installed and up to date as of 10/17/01.

Tbdaq-5 – no problems.

Tbdaq-6 – had trouble with CD media during install. Cleaned CD. Seemed ok. Still should cable 2$^{nd}$ IDE bus. First or second startx froze. Startx worked after that. Will watch.
Swapped CPU out into 2. Will wait for new CPU. Install on disk should be ok.
11/9/01 got new CPU in there – works like a charm.

**MAC addresses:**

tbdaq-1 MAC address: 00:E0:4C:56:00:1F
tbdaq-2 MAC address: 00:E0:4C:55:00:20
tbdaq-3 MAC address: 00:E0:4C:51:00:A3
tbdaq-4 MAC address: 00:E0:4C:56:00:20
tbdaq-5 MAC address: 00:E0:4C:51:00:67

These are fixed by the hardware.

**Appendix - BIOS Settings**

These were taken from tbdaq-6, which is the DOMCOM PC which is staying at LBNL.

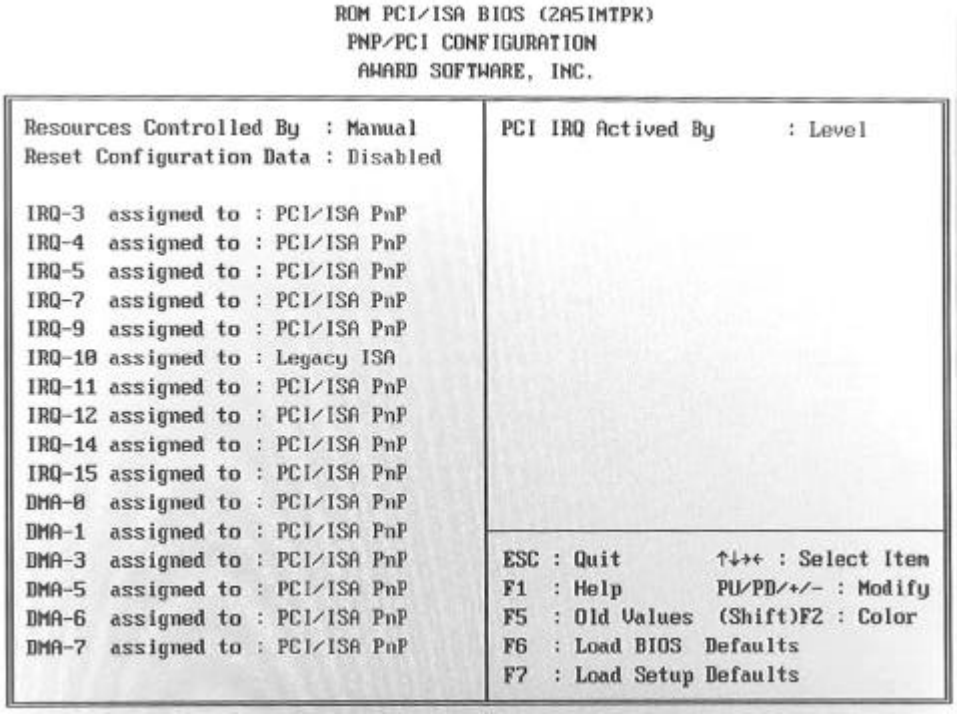
## Version information

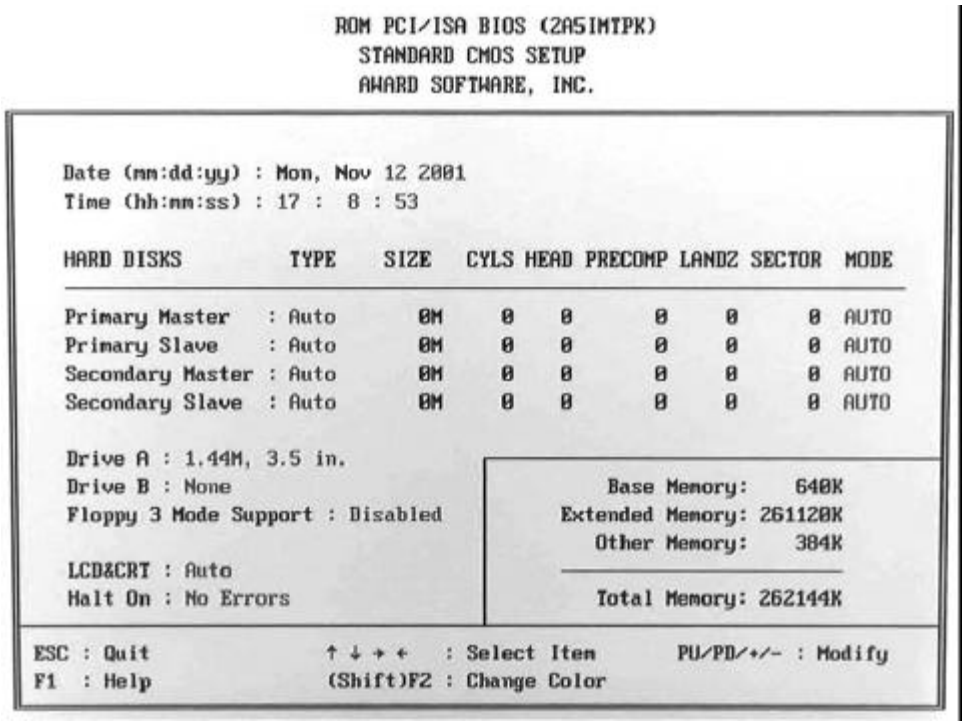
```
Award Modular BIOS v4.51PG, An Energy Star Ally
Copyright (C) 1984-2000, Award Software, Inc.

A-675 VER:1.1
```

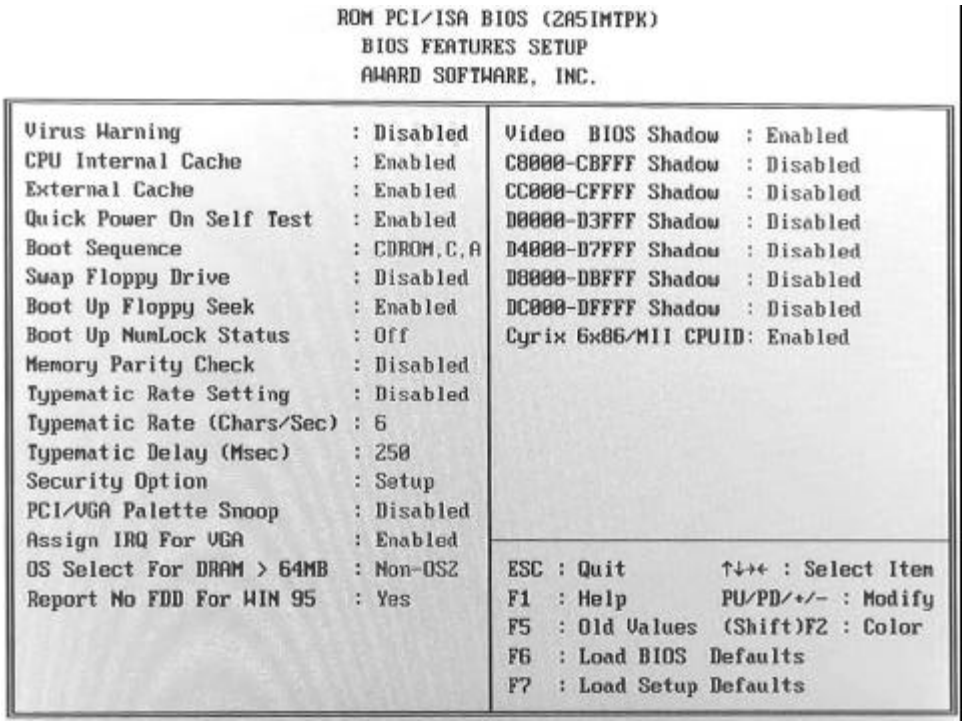
## Changeable BIOS Settings (not in order)

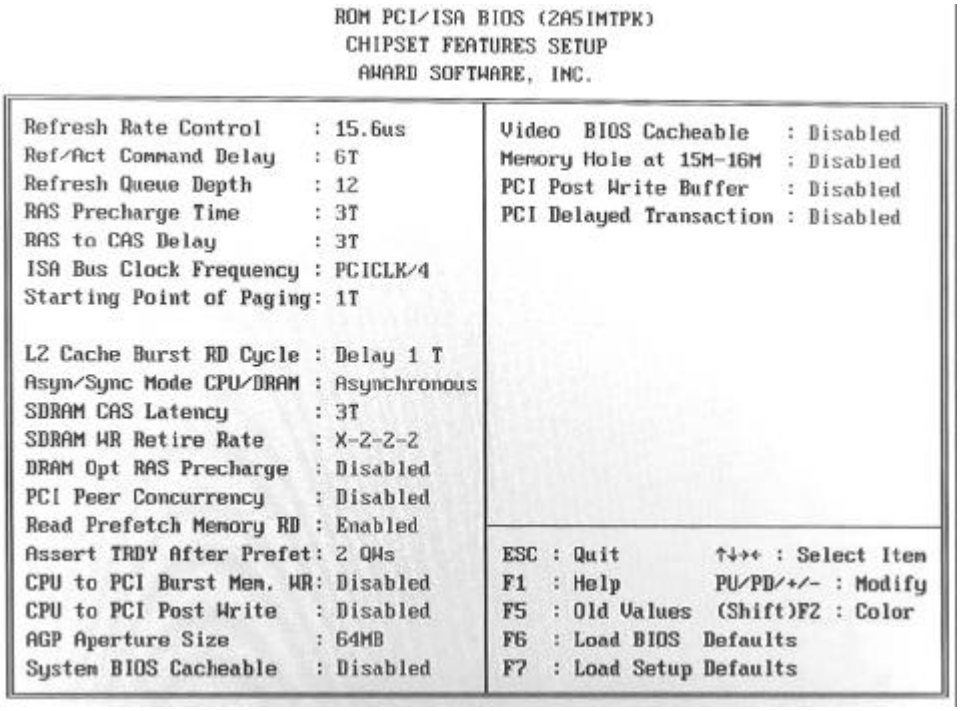
This is the most important screen - you have to change the setting for IRQ 10 in order for the device driver to work:

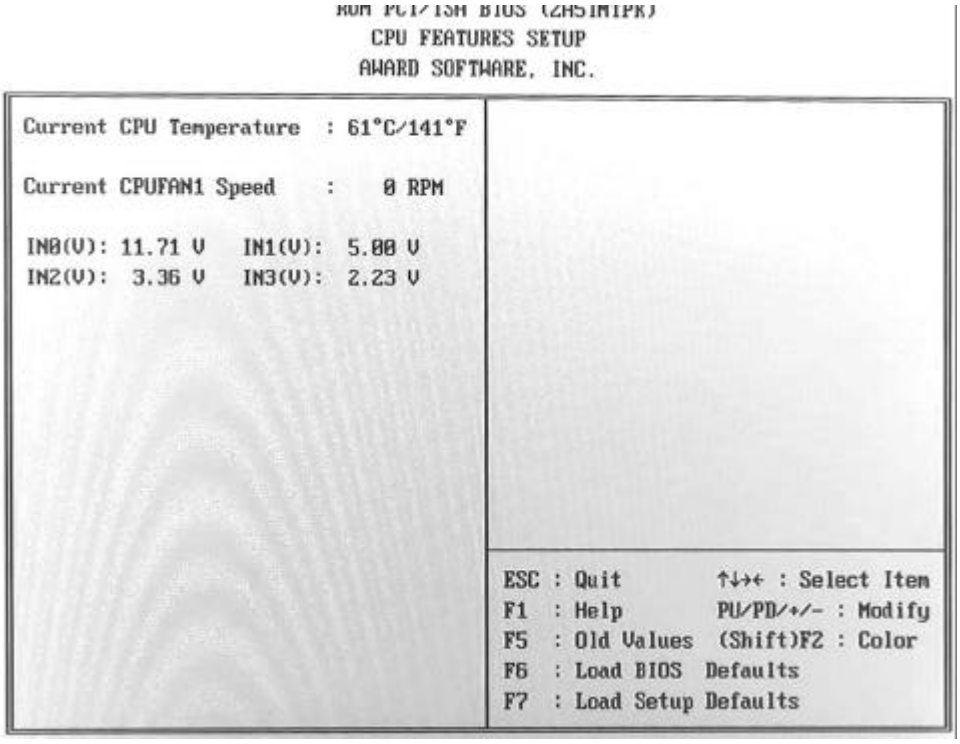





Changing the “Boot Sequence” setting as shown below allows one to boot from CD-ROM during installation or upgrade of the operating system.




ROM PCI/ISA BIOS (2A5IMTPK)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.
Refresh Rate Control : 15.6us
Ref/Act Command Delay : 6T
Refresh Queue Depth : 12
RAS Precharge Time : 3T
RAS to CAS Delay : 3T
ISA Bus Clock Frequency : PCICLK/4
Starting Point of Paging: 1T
L2 Cache Burst RD Cycle : Delay 1 T
Asyn/Sync Mode CPU/DRAM : Asynchronous
SDRAM CAS Latency : 3T
SDRAM WR Retire Rate : X-2-2-2
DRAM Opt RAS Precharge : Disabled
PCI Peer Concurrency : Disabled
Read Prefetch Memory RD : Enabled
Assert TRDY After Prefet: 2 QWs
CPU to PCI Burst Mem. WR: Disabled
CPU to PCI Post Write : Disabled
AGP Aperture Size : 64MB
System BIOS Cacheable : Disabled
Video BIOS Cacheable : Disabled
Memory Hole at 15M-16M : Disabled
PCI Post Write Buffer : Disabled
PCI Delayed Transaction : Disabled
ESC : Quit ↑↓→← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults


CPU FEATURES SETUP
AWARD SOFTWARE, INC.
Current CPU Temperature : 61°C/141°F
Current CPUFAN1 Speed : 0 RPM
IN0(V): 11.71 V IN1(V): 5.00 V
IN2(V): 3.36 V IN3(V): 2.23 V
ESC : Quit ↑↓→← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Some of the machines were shipped with power management settings which would cause the machines to go into standby mode after four hours. The following settings should remove this possibility: